LAP®3000

The LAP®3000 is a radar wind profiler that reliably provides continuous and real-time vertical profiles of horizontal wind speed, wind direction, vertical wind speed and turbulence in the atmospheric boundary layer and beyond.

The operation is based on the scattering of electromagnetic pulses at inhomogeneities in the air with subsequent Doppler analysis of the backscattered signal. The wind vector is derived using the beam swinging method.

The LAP®3000 radar wind profiler provides upper-air data with high resolution in time and height. It can substitute extensive radiosonde launching schemes. The LAP®3000 works automatically and is virtually maintenance free. It is economic to operate and suited for operation at unmanned, remote sites.

The new Digital IF Processor SIRP offers characteristics never found in wind profiler signal processing before. This results in higher data quality, better height coverage and more flexibility to tailor the system output to the user's specific needs.

Features

- maximum range up to 5 km and more
- patch array antenna
- binary pulse coding
- Advanced Coherent Noise Suppression ACNS
- free positioning of range gates
- unlimited multiple-mode capability
- built-in system monitoring
- RASS extension available

Applications

- air quality
- aviation operations
- defense
- atmospheric boundary layer research
- emergency response
- global change research
- mesoscale meteorological forecasting
- vertical wind shear and turbulence
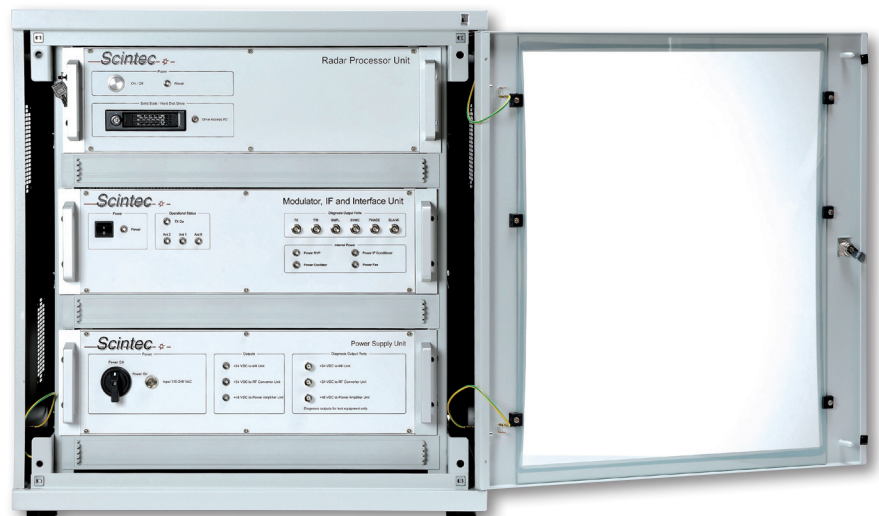
Scintec

Uncompromised Wind Profiler Antenna Concept

The patch array antenna of the LAP®3000 has no moving parts, ensures long-term reliability and avoids safety hazards. Using a true vertical beam, vertical wind and turbulence are accurately measured and precipitation is identified. The beams point into perpendicular directions and can be set parallel to the Earth coordinate system North-South and East-West consistent with the meteorological definitions of u and v. A fast switching between beams enhances accuracy in complex terrain. An antenna heating is available to improve system performance in cooler climates.

A New Digital Signal Processor for Wind Profilers

The new SIRP Digital IF Processor was specifically developed for radar wind profilers. It combines Advanced Coherent Noise Suppression ACNS, vertical signal oversampling, 16 chip binary pulse coding, true Gaussian matched filters, and freely programmable height gates. Vertical range resolution can be set to values finer than 50 m. The revolutionary ACNS cancels distinct radio frequency interferences and improves data quality at sites suffering from radio pollution.

Scintec LAP®3000 indoor units

Comfort and Flexibility: the New Operation Software
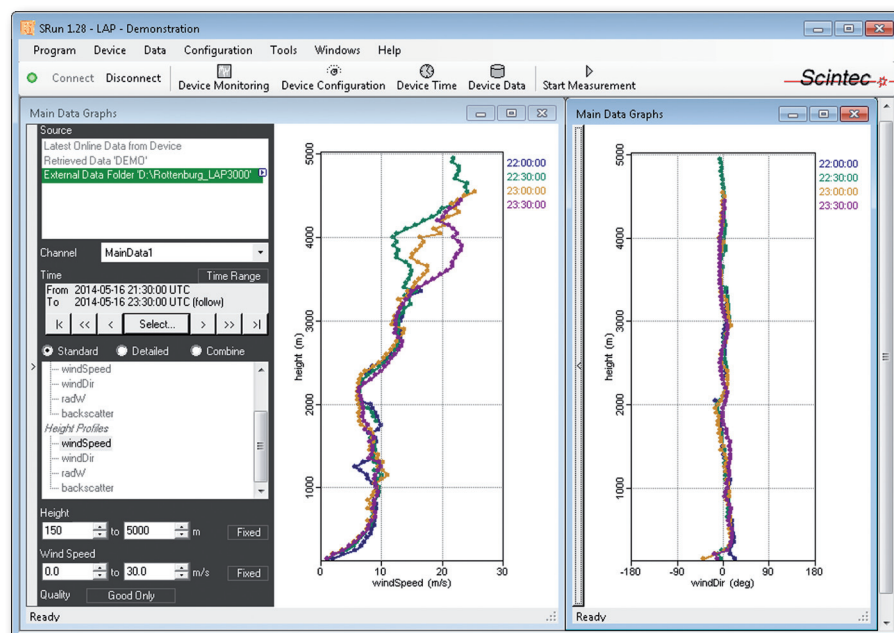
Operation software

The SIRP interfaces to the computer using USB 3.0, supporting highest data rates. With unlimited multiple mode capability, different settings with respect to pulse length, pulse coding and pulse shaping can be operated simultaneously. This allows a single wind profiler to support different applications at the same time. An auto configuration option optimizes the settings without need of user interaction. A variety of graphical data representations, data output formats and data transfer options matches all needs.

RASS Extension Available for Precise Temperature Measurements

A RASS extension is optionally available to make the radar wind profiler a combined RASS wind and temperature profiler. The accuracy of the RASS temperature measurement is far better than that of any other remote temperature measurement technique.

Software Specifications

Description	Specificaton
Data output	Horizontal wind speed and direction, wind components u, v and w, standard deviations of wind, backscatter, spectra, moments, time series of I/Q samples, quality levels
Real-time monitoring	Real-time monitoring variables for all hardware units
Automatic self-test	Automatic hardware test for all hardware units under controlled conditions
Control and configuration	Graphical user interface, no manual editing of configuration files required
Displays in real-time	Wind barb and vector plots, time vs. height color plots, profile plots, time series plots, spectra plots and tabular displays
Displays offline	Same as displays in real-time
Data export in real-time	Network output via FTP, TCP, UDP or shared folder
Reprocess capability	Reprocess of time series, spectra, moments or main data, fully configurable through graphical user interface
Automation capability	Additional network and command-line interfaces for automated measurement control, change of configuration and data reprocess
Operating system compatibility	Windows 10, Windows 8, Windows 7, Windows Server 2016, Windows Server 2012 R2, Windows Server 2012, Windows Server 2008 R2 with native 64-bit support
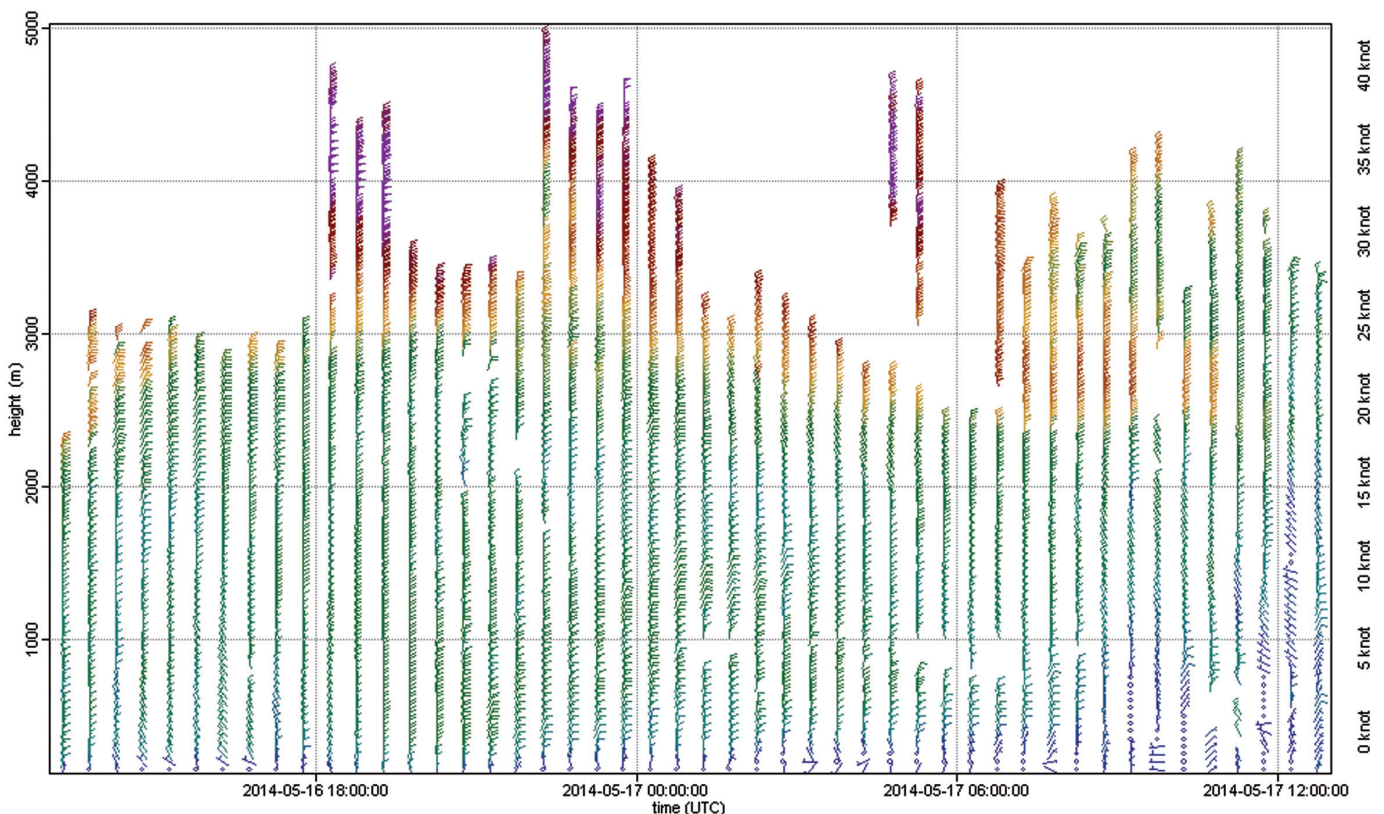
LAP®3000 data sample: wind barbs

LAP®3000

Available Versions (other operation frequencies and antenna sizes on request)

Order code A050000: Operating frequency 1290 MHz, 4-panel antenna
Order code A050001: Operating frequency 1290 MHz, 9-panel antenna
Order code A050002: Operating frequency 915 MHz, 4-panel antenna
Order code A050003: Operating frequency 915 MHz, 9-panel antenna
Order code A050005: Operating frequency 1357.5 MHz, 4-panel antenna
Order code A050006: Operating frequency 1357.5 MHz, 9-panel antenna

Basic Specifications

Description	Specificaton
Operating frequency	[A050000], [A050001]: 1290 MHz, [A050002], [A050003]: 915 MHz, [A050005], [A050006]: 1357,5 MHz, other frequencies on request
Antenna type	Electrically steerable micropatch phased-array panels
Antenna gain	[A050000]: 28.2 dBi, [A050001]: 31.7 dBi,[A050002]: 24.9 dBi, [A050003]: 28.7 dBi, [A050005]: 28.6 dBi, [A050006]: 32.1 dBi
RF beam width (-3 dB, full width)	[A050000]: 7.1°, [A050001]: 4.8°, [A050002]: 10.4°, [A050003]: 6.7°, [A050005]: 6.8°, [A050006]: 4.5°
Antenna aperture	[A050000], [A050002], [A050005]: 3.0 m² approximately [A050001], [A050003], [A050006]: 6.7 m² approximately
Beams	4 oblique beams N, E, S, W and 1 vertical beam
RF power output	[A050000], [A050001]: 1000 W peak [A050002], [A050003]: 800 W peak [A050005], [A050006]: 700 W peak
Pulse width (selectable)	265 - 3340 ns
Minimum height	100 m approx.*
Maximum height	[A050000], [A050001], [A050005]: Up to 4 km in clear air and beyond in precipitation* [A050002], [A050003], [A050006]: Up to 5 km in clear air and beyond in precipitation*
Height resolution (selectable)	40 - 500 m, depending on pulse width
Wind speed accuracy	<1 m/s
Wind direction accuracy	<10°
Measurement range of horizontal wind speed components	-200 to 200 m/s, larger ranges configurable
Measurement range of vertical wind speed	-50 to 50 m/s, larger ranges configurable
Averaging time (selectable)	3 - 60 minutes
Power requirements	100 - 240 VAC, 1000 W
Operating conditions outdoor components	Temperature: -40°C to +50°C Relative humidity: 0% to 100%
Operating conditions indoor components	Temperature: +10°C to +35°C Relative humidity: 0% to 80% non-condensing

*) depending on settings, meteorological conditions and environment

Specifications are subject to change without notice.

Extensions and Accessories (to be ordered separately)

Order code A050040: RASS Extension
Order code A050012: Antenna heating for [A050000], [A050002], [A050005]
Order code A050013: Antenna heating for [A050001], [A050003], [A050006]

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